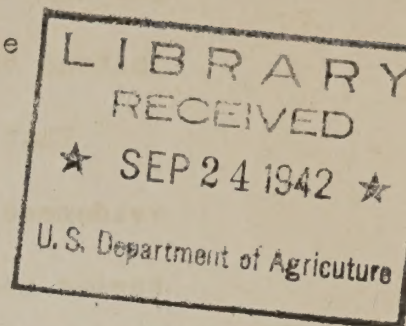


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U.S. Farm security administration, Region X,  
THE DEPARTMENT OF AGRICULTURE AND THE WHEELER-CASE PROGRAM  
FSA, Reg. 10

(Address by C. H. Willson, Area Director, before the  
Association of Western State Engineers, Phoenix,  
Arizona, October 14, 1941.)



WATER - THE LIFE-LINE OF WESTERN AGRICULTURE

Seventy-five or eighty years ago if Alladin had been transported to the top of one of the peaks surrounding the Salt River Valley and had been told to bring forth the strongest magic of his famed lamp, I doubt if the lamp could have wrought the magic that water has in this valley.

Picture, if you can, what this entire valley, this city we are meeting in, would be without the magic of irrigation. Water has transformed a sea of heat waves, sleeping lizards and lonesome cacti into one of the most beautiful valleys in America. And this is only one of innumerable communities where water has been the Alladin lamp to transform dry lands into productive farm lands. Water is the keystone in the arch of western agriculture -- the main factor upon which successful use of many western lands depend. Without irrigation the West would be but a shell of what it is today. It could support only a fraction of its present population and would be only a minor factor in the nation's agricultural economy.

Without artificial watering many cultivated crops could not be grown, and even livestock production would be materially reduced. Except for the Pacific Coast area, the northern half of the West generally depends upon irrigation to furnish the needed winter feeds for livestock. These irrigated lands provide the oasis which unlocks



the use of millions of acres of grazing land and permit a domestic, instead of a nomadic, farm economy.

That the West has long recognized the importance of irrigation is evidenced by a statement made by the Supreme Court of one of the territories nearly 70 years ago: "In a country such as this, water for irrigation is equally necessary as water to sustain life, they are terms meaning the same thing."

Actually, the irrigated territory of the United States ties the East and West together into one nation which otherwise might be divided by the western part of the Great Plains and the Intermountain Region. Agricultural development has taken place on both coasts and westward as far as the central part of the Great Plains. Were it not for the great irrigated territory between, the East and West might be more effectively divided than were the North and the South by the Mason-Dixon line.

There are now nearly 20,000,000 acres of irrigated land in the 17 Western states, requiring an estimated 72,000,000 acre feet of water. In some states, over 90 per cent of all farms are irrigated. Nearly one-third of the value of all crops harvested in 1929 in the 17 Western states came from irrigated land and amounted to nearly 900,000,000 dollars. In eight of these states, over one-half of the crop income comes from irrigated land. Over one billion dollars now is invested in irrigation enterprises.

These are impressive figures and testify to the ingenuity and imagination of the engineers in bringing water and land together. And the task is, of course, not finished, since there are in the West



many more million acres of good land needing only the waters of some near or distant stream to be transformed into fertile fields and productive communities.

THE UNITED STATES DEPARTMENT OF AGRICULTURE AND WESTERN DEVELOPMENT.

JAN 14 1949

Since water is such a basic factor in Western agriculture much of the future of this area depends upon the manner in which the limited supplies are used. Too much water may be even more harmful than too little. The relationships between soil and water and between plants and water are basic considerations in crop production. Success also depends upon proper rotations, development of the best varieties of various crops, elimination of plant and animal diseases, alkali control, and so on.

The United States Department of Agriculture being vitally interested in the success of Western irrigated agriculture has made major contributions thereto. In cooperation with State Experiment Stations, the Department has a long record of successful research in crop adaptation and the development of new varieties. Examples are the development of smut-resistant, better yielding varieties of oats, a better yielding and winter resistant variety of alfalfa. In the field of plant diseases, major contributions have been made in combating curly top in sugar beets, controlling some virus diseases of potatoes, and improving disease resistance of white beans. The Department of Agriculture introduced the date industry in the southwest and has continued to experiment with new and better varieties, as well as with



better cultural practices. Major contributions have been made by the Department in the field of water requirements of plants and in methods of irrigation, the importance of which we all recognize since our water supply is scarce relative to land.

These are only a few examples of the way in which the Department of Agriculture and the State Experiment Stations, through their research facilities, have aided in the successful development of western irrigated agriculture. Countless more could be cited. The Department also has been active in the educational field, primarily through the cooperative State Extension Services. By this means, results of research are transmitted into practical use quickly and efficiently.

In the field of credit, the Department of Agriculture has participated in Western irrigation development through the facilities of the Farm Credit Administration and the Farm Security Administration. The former has provided both long and short term financing to farmers for a period of 20 years or more. On January 1, 1940, it was estimated that 37 per cent of the farm mortgage loans in the United States were Federal Land Bank and Land Bank Commissioner loans. It is also worth noting that this agency has provided credit for eligible farmers at much lower interest rates than was the case previously, thereby enhancing the living level of farm people as well as their ability to pay their irrigation and other charges.

The Farm Security Administration is a relatively new agency of the Department of Agriculture but one which has played an important role in the development and maintenance of irrigated agriculture. It has provided low-cost financing for farmers who have been unable to obtain



credit elsewhere. It also has helped these farmers with their production problems, thereby insuring greater security and stability on the irrigation projects.

The Farm Security Administration also has made major contributions to successful irrigation development in other ways. Through its resettlement program, it has helped develop projects formerly operated in large farm units and with methods too extensive to permit maximum returns. It has also in this way relieved the pressure of population in surrounding dry land areas, where widespread public assistance has been necessary because of over-crowding.

#### SETTING UP A NEW FARM ON IRRIGATED LAND.

It may be well at this point to analyze briefly the problems of a farmer in getting a new farm under way on an irrigation project. Too often we fail to realize all the various difficulties to be overcome and condemn the farmer if he fails to make a go of it. Perhaps many of us think too much in terms of dry land homesteading procedure in the horse and buggy days, when a man with good health, a wife, cow, and a set of harness could get started farming without too much difficulty. He might get horse power free from ranchers -- if he was willing and able to break some western broncos. He might borrow a plow and seeder from a more fortunate neighbor. He probably lived in a dugout or tar-papered shack. His wants were few and the cash required for existence very meager. He could break up the prairie sod, put in some wheat, and, if the Gods smiled, he could gradually accumulate the necessary production resources to continue operations and, in time, build a livable home. He homesteaded, hence he paid no taxes for a few years.



Contrast this with a farmer who starts out today on a new irrigated farm. To begin with, he is probably a man with a family and with little or no financial assets. He is an experienced farmer, but most likely on dry land. He has to have a place to live. Our national policy of 1941 does not have the dugout nor tar-papered shack on its list. We are committed to the idea of seeing to it that all our people have the kind of place to live in which is conducive to health and to national stability and security. We are arming today to defend this concept. True, our farmer does not need a castle, but he should have shelter which keeps out the elements, have room enough for a growing family, and be sufficiently comfortable to maintain health. Irrigation farming is hard work.

Next, our farmer needs shelter for his livestock. He generally must have livestock, for without it he cannot maintain the fertility of his soil nor get some assured income from the feed crops necessary in the rotation. These buildings need not be elaborate but even so they cost money.

Our farmer needs a well. In the past, many farmers have had to obtain their domestic water from an irrigation ditch, with consequent hazards to themselves and the neighborhood. In places a well can be dug by hand, elsewhere it may cost \$200 or even more.

The farm must be fenced and cross-fenced, since livestock must be part of the farm operations. Fencing costs, on the average, about \$100 per mile, for 3 barbed wire, although this may be reduced if the farmer has the time and access to free posts.

With these bare essentials, omitting any attempt to make the farmstead



more livable by shelter belts and so on -- the farmer is ready to start farming. He cannot get free power today, hence some horses or a tractor are necessary. Other livestock, cows, hogs, and chickens, must be acquired, not necessarily a fully stocked setup the first year but enough to get into full production rather quickly.

The new farm may be partially or entirely covered with sagebrush or other growth which cannot be plowed under. Some land clearing, therefore, may be necessary. If this growth to be cleared away is fairly heavy, some special implements may be necessary for adequate plowing.

After the land is cleared and plowed, leveling generally is necessary in order to get efficient use of the water. Since the water may be expensive, its most efficient use, with minimum waste and maximum results, is imperative. The land may be quite flat, which means careful and perhaps extensive grading operations in order to permit free flow of the water and in order to get it off the fields when irrigation is completed. The farmer can do this work himself. If heavy leveling is involved, however, it might take him several years to get his whole farm leveled. In the meantime, he would be getting poor crops and, without a considerable financial reserve, he would be bankrupt. If leveling costs are \$15-25 per acre, considerable initial capital is required to prepare even a small irrigated unit.

On most projects the irrigation system generally is built to provide for delivery of water to the high point of each farm unit. This means that before our farmer can irrigate his land he will have to construct the necessary farm distribution system, which, in most cases,



involves minor structures such as drops and farm turn-outs. Putting these in requires not only funds but also considerable skill on the part of the farmer.

After leveling is completed, farming can begin. Experience shows, however, that even good raw dry land which has been leveled will not produce the kind of yields necessary under irrigation farming for a few years. A development period is involved, for getting humus into the soil and getting a crop rotation under way. Farming is not different in this respect than most other business undertakings. A doctor, a lawyer, or an engineer generally does not go into full production immediately the shingle is hung out. It is necessary, too, for our farmer to be prepared to obtain much less than maximum returns during the first few years but, at the same time, meet his regular charges for water, taxes, operations, and so on, in addition to adequate living for himself and family.

These are, in a general way, the major items involved in getting a new irrigated farm under way on an irrigation project. If our farmer has not had any experience in irrigation farming, you can readily see what additional problems are imposed upon him. His overhead costs are fixed, like our rent and lights. They require cash and this must come from the soil. Few people with any substantial reserve take up farming today.

Little wonder that the path of agricultural financial progress on many of our larger irrigation projects is strewn with bankrupt farmers. Few have had the financial reserves or backing to provide the initial necessary outlays in getting started and in carrying through



the development period. Experience shows that in too many cases the farmer who finally succeeds does so because he has been subsidized by one or more predecessors who went bankrupt trying to meet their overhead costs on a partially developed farm. The extent of this "subsidy" is a matter of conjecture, but probably adds up to a considerable amount in money. Then there is the social cost of such failures which may be even more costly. We cannot afford to have such things happen. It is within our power to prevent it. The history of the past nations -- both in the old world and the new -- has shown that agriculture on undulating lands has eventually had to give way, owing to erosion. It may well be that the irrigation projects of today will be the principal producers of feed crops in the Great Plains and Intermountain Regions in the centuries to come.

HELPFUL ACTION BY THE GOVERNMENT THROUGH THE UNITED STATES DEPARTMENT  
OF AGRICULTURE

The ways in which the Federal Government can help farmers in getting started on new irrigated farms have been demonstrated during the past few years through the operations of the Department of Agriculture on resettlement projects, through its participation with the Bureau of Reclamation in developing Water Conservation and Utilization projects, and through its activities authorized by Senate Bill 2410, an Act relating to the development of farm units on public lands under Federal reclamation projects with funds furnished by the Farm Security Administration.

Recognizing the extent and magnitude of the problems facing farmers on new projects, the Congress of the United States has authorized and



the Department of Agriculture has developed a program intended to meet and overcome them. Briefly, the Government purchases available land on these irrigation projects, where the land is not already in public ownership, clears and levels the land, subdivides it on the basis of family-operated farms, provides suitable improvements, accepts farmers in need of relocation from over-crowded dry land or irrigated areas, provides capital for livestock and equipment when necessary, and lends operating capital during the development period.

The Government policy for decades has been to create opportunities for the maximum number of farmers on family-operated farms on new irrigation projects. To this end, holdings in excess of a family-size unit are utilized. This excess land and the absentee owned land may be sold to the Government at an appraised price as determined by impartial appraisers. This land then is cleared and leveled to the extent necessary and justified, with the use of modern equipment and under the guidance of experienced engineers. In all cases, the soil and the permissible economic limits to expenditures are the guiding factors in determining the extent of leveling done. The farm distribution system is planned and provided for at the same time.

Suitable farm buildings and other necessary improvements are constructed on the units after the necessary size has been determined and subdivision completed. The new farms may or may not conform to a rectangular pattern, since topographic features, in addition to soil types, natural boundaries, and so on, are considered in sub-division. The buildings erected are what today is considered minimum standard



housing for comfort and sanitation. You are all familiar with the Government's policy on this question, both in regard to rural and urban housing. The outbuildings are very modest but considered adequate until the farm produces enough income for needed expansion.

It may be added in this connection that these improvements are placed on land owned by the government. No one would recommend tarpaper shacks as Government residences.

In determining the size of new units on irrigation projects, the Department's policy is to establish family-operated farms, with emphasis on security for the family. Relatively few farm families ever get rich from farm operations alone, and many more go broke, hence this need for emphasis upon the farm size necessary for the security and adequate living of the farm family. Farms set up to date in the Great Plains generally vary from 80 to 160 acres, depending upon the cropping program possible.

In practically all of the old irrigation projects of the West, irrigation ditches and drain ditches cut through the farm units at all sorts of angles. This was true because land subdivision was made on the basis of the township, section, and quarter-section, without any regard for the topography of the land. Instances can be shown where an 80-acre unit was cut into five or more separate fields, each of them in odd shape. In some cases, the farmer could not reach all of these fields without going around the main road more than a mile. Little wonder that he has left unfarmed small spaces between ditches and in fence corners which were not readily accessible



with agricultural machinery.

This inaccessibility of small fields and ditch banks has led to a weed problem which bids fair to be one of the major problems of the irrigated sections of our Western States. Unit subdivision on Water Conservation and Utilization projects is being done in such a way that the unit boundaries conform to irrigation and drainage ditches. A minimum of actual division of the unit will take place. Insofar as possible, every opportunity will be given the owner to farm every available inch of his land and at the same time permit the District to keep the ditch banks clear of weeds. In addition to this, a minimum amount of permanent ditch will be used on each farm unit. This will permit the settler to plow in most farm ditches each year, level the land, and thus get rid of the weed and insect nuisance which is always present where permanent farm ditches are used.

Guidance is also provided, not only in the farm improvement work during the development period, but also in organization and production problems thereafter. This may sound as though there was little left for the settler to do. In actuality, he is undertaking one of the most difficult agricultural businesses in the world -- that of successfully operating an irrigated farm. In preparation for his arrival, the Government has done only those things in the providing of water and land which can be done more economically by the Government with the use of skilled technicians, heavy equipment, et cetera, than by the individual farmer. The land development is carried only to the point where the settler can take hold and carry on with the leveling



and farming operations within the capacity of the equipment and resources at his command.

Buildings provided at savings through large group contracts are not homes. The settler's family has to do much work in fixing them up. The entire farm family acquires a sense of ownership and pride in their place through the many arduous tasks necessary in making a home out of a farmstead. Planting and nurturing a shelter belt, a farm orchard, garden and lawn, ornamental planting about the house, farmstead fencing, painting and repair, as well as minor land leveling, farm ditching, soil improving, seeding of permanent grasses and legumes, et cetera, on the more extensive acreages in the fields, all are vital parts of making and building an irrigated farm and home.

An earnest attempt is being made on Water Conservation and Utilization projects to design buildings which are adapted to the sections in which they are being constructed. Too often, the new settler in a new irrigated territory copied the buildings of the humid section from which he came, and thus was encumbered with more investment than the land would bear.

Some criticism is usually forthcoming from various quarters relative to the high cost of land leveling. Actual experience at our Western Slope Farms Project has shown the cost of leveling land with horses and slip scrapers to run as high as \$60 an acre -- whereas the same leveling could be done with heavy machinery at less than one-third of this figure. It is a significant fact that yields from irregular fields may be extremely spotted, due to poor water distribution.



On the Water Conservation and Utilization projects careful soil analyses are made and permissible cutting depths indicated for land leveling. On the Angostura Project in South Dakota samples have been made of various parts of the area. From these data, a map will be constructed which will show maximum depths to which cuts can be made in land leveling, and at no point will this be exceeded.

When ready for settlement, farmers are accepted from dry land areas where farming opportunities are limited by population pressures. For example, you are all no doubt familiar with the economic conditions which have prevailed in the Great Plains during the past decade or two. You know about the hundreds of millions of dollars which have been expended in that vast area for sustenance of distressed farm families. By careful selection of these families, a double job of rehabilitation is possible. In a dry land farming area one family is given a new opportunity on an irrigated farm. Another family, who remains in the dry land area and who needs some additional land, will be given an opportunity to acquire the land vacated by the farmer who moves. In a dry land grazing area it may be advisable to have all homes and headquarters on the project. This would reduce or eliminate the social and governmental costs in the adjacent dry land grazing areas and, by making these grazing resources available to project settlers, increase the number of families that may be given opportunity on the project. In this manner and by continuous development of new irrigated areas, the necessary adjustments in land resource use, both dry and irrigated, and in human and total natural resources may be accomplished.



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A new irrigated farm developed by the Government generally is not sold to a new settler immediately upon completion. Experience shows that it is folly to sell a farm to an individual before he is ready and able to buy it. Stable and equitable tenure is the first and prime need of the thousands of farm families with which Congress is primarily concerned in its determination to develop irrigated projects in the West. Quoting from the Act entitled "An Act authorizing construction of water conservation and utilization projects in the Great Plains and arid and semi-arid areas of the United States", commonly called the Wheeler-Case Act, Section 1 reads "For the purpose of stabilizing the water supply and providing opportunities for permanent settlement of farm families". With a past experience of excessive debt or unstable tenancy, without capital beyond operating needs, and without experience in farming under the conditions prevalent on new irrigation projects, settlers generally prefer a period of leasing. They consider this a trial period for determining the soundness of operations under the project and their adaptability to irrigated farming. Leasing arrangements provide that during a development period of a few years, the terms be arranged so as to compensate the farmer for building up the productivity of the land.

In some cases, settlers may not even occupy the new farms as tenants until the land has been operated for a year or more. This is especially important on lands which are difficult to subdue and which yield little or nothing until built up by the use of certain soil-building crops. In any case, the new settler is accepted after



the farm is determined to be sufficiently productive to permit the family to live and the farmer meet his charges.

Each new settler is financed, to the extent necessary, for livestock and equipment. This does not mean a full line of machinery, but only such as cannot be handled on a cooperative and exchange basis with the neighbors.

The main points I wish to emphasize are the many and difficult problems facing a farmer on a new irrigated unit as well as the methods now being used to permit him to get started with a real opportunity to succeed. Most of our present day irrigation developments are relatively costly, which means that the greatest possible returns must be gotten from the land right from the start. Water charges against 80 acres cannot be met by farming only part of the land.

The Department of Agriculture has gained many valuable experiences in carrying on its settlement work during the past few years. Mistakes may have been made in various phases of the program. This is only natural in any new and untried field. We have profited by these mistakes and have now developed a program where it will be of great benefit, both to new operators of irrigated farms and to society as a whole. A continuing critical and constructive attitude toward the program on the part of all of us will undoubtedly be of much aid in further improvement.

The public has a large stake in the success of the irrigation projects. Considerable public investment is involved in their construction and development and, moreover, society always has a very material interest in any permanent resource development. The Government invests



in these new projects in the interest of its people and should, therefore, be vitally concerned in the success of the undertaking. In the past much criticism has been levied at the Government's lack of initiative in settling irrigation projects. More recently, considerable criticism has been levied at Government's activities in settling irrigation projects. Much of such criticism has not been particularly constructive. What is needed is for all of us to work together in doing the best possible job we can.

Since 1935, the Department of Agriculture has established 176 settlement projects in the 48 states. 65 of these are in the 17 Western States and many are on irrigation projects. These projects embrace a wide variety of conditions and hence furnish the needed experience for successful continuation and expansion of the program. Many have been entirely experimental. Various methods of settlement, of land tenure, of financing, and so on, have been tried. Some have proven better than others and what has worked best in one area may not succeed in another. However, invaluable experience has been gained which, with the interest and cooperation of all concerned, should insure a successful fruition of this very much worthwhile program of resource development and use.

In every case possible, the Department of Agriculture has taken an area approach to the problem of irrigation project development and use. In much of our West, millions of acres of grazing land are of little value without some irrigated land to provide winter feed. These two classes of land resource must, therefore, be integrated in their use. An analogous relationship



exists in areas of dry land farming where the rainfall is too scant and uncertain to insure stability of farm income. In such areas, it might be possible to integrate the use of the dry and irrigated land by tying relatively small parcels of irrigated land to those dry farms near enough to operate both economically. Many of our dry land areas in the Plains still are over-crowded, in spite of the large migrations westward during the past 10 years. These migrations will continue and will resume their intensity the first year another severe drouth occurs. Irrigation development, accompanied by a sound settlement policy, will go far toward eliminating this costly and unsound trek of destitute people seeking new opportunities where there already may be over-crowding.

#### WHAT OF THE FUTURE?

Irrigation developments, new and supplemental, should continue, both as a part of our national defense program and as a vital link in Western resource development. Many areas now partially irrigated need supplemental water and many need considerable agricultural readjustments. Some are grossly over-crowded from the continuous splitting-up of holdings among heirs. Others have run-down distribution systems which must be reconstructed if a general exodus of the farm families is to be prevented.

Guided settlement must accompany any new land developments. The public has too much at stake to leave this all important phase of the work to chance. The ordinary new settler does not have the funds to develop his farm, and provide the necessary improvements and equipment. Without adequate



financing and technical guidance, success is doubtful, which, in turn, casts reflections on the soundness of the irrigation development program itself.

The Department of Agriculture expects to continue to play its part in this all-important program. It expects to continue its research and educational programs, which play such a vital part in successful agriculture. It is, together with the Bureau of Reclamation, actively engaged in the development of several projects under the Water Conservation and Utilization program as provided by the Great Plains appropriation and the Wheeler-Case Act, as amended October 14, 1940.

As you know, the Wheeler-Case and the Water Conservation and Utilization programs are carried on jointly under several Federal agencies. Under the Water Conservation and Utilization Acts, the Bureau of Reclamation of the Department of the Interior investigates possible irrigation projects in the 17 western states, and designates certain projects as suitable from an engineering point of view for inclusion in the program. The Department of Agriculture then investigates the agricultural and economic phases of these recommended projects. Both the Secretary of the Interior and the Secretary of Agriculture submit letters to the President, in which they state their findings with respect to the feasibility of the proposed development and request the total budget necessary, including the non-reimbursable sums to be provided by the Works Projects Administration or other agencies as may be designated to participate.

In the future operation of these projects, it is our plan and hope that associations of settlers will be organized, and through such associations local management and operation will be possible. Any



necessary governmental project supervision will be supplied either by the Bureau of Reclamation or the Department of Agriculture, as may be determined by agreement between them. The objective is to provide the simplest, most direct relationship possible between local settlers and/or their associations and the Government.

Work on these new projects is progressing satisfactorily, of course within the limits of the defense program. The Department of Agriculture is operating its field activities in this program through its office in Denver, Colorado. All its field activities pertaining to the program are unified and administered out of that one central office. In this way action can be taken quickly and efficiently, which is necessary in any such program involving more than one Government agency.

I am happy to have this opportunity to go over with the Western Association of State Engineers some of the problems we are all working on. Your respective offices form a clearing house for information on matters pertaining to irrigation development. Much information is available from you men that will be needed from time to time, and we feel free in calling upon you for this information. We expect to have many contacts with you as this work goes on and sincerely seek, and will use your advice on this important program.

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